WE CLAIM:

1. A device comprising:

a first dielectric interposer layer through which a number of thru-vias extend; and

a second dielectric layer adjacent said first dielectric interposer layer, where said second dielectric layer includes a high *k* material surrounding thru-vias to deliver power signals to a die and a low *k* material surrounding thru-vias to provide signals other than power signals to a die;

wherein an area of the high *k* material of said second dielectric layer is extended to surround at least one thru-via to provide a signal other than a power signal to a die.

2. The device according to Claim 1, wherein said extended area of high *k* material of said second dielectric layer comprises an embedded capacitor so that said at least one thru-via to provide a signal other than a power signal provides AC coupling for signals other than power signals.

3. The device according to Claim 2, wherein said at least one thru-via to provide a signal other than a power signal to a die is surrounded by the extended area of high *k* material of the second dielectric layer forming an AC coupling network; wherein the extended area of high *k* material of the second dielectric layer is adjacent low *k* material that surrounds thru-vias to provide signals other than power signals to a die; and wherein said at least one thru-via to provide a signal other than a power signal to a die is surrounded by a space at an end of the at least one thru-via adjacent a signal bump in order to separate a power delivery network from the AC coupling network.

4. The device according to Claim 3, wherein the AC coupling is for differential signals used for Peripheral Component Interconnect (PCI) applications.

5. The device according to Claim 1, wherein the first dielectric interposer layer has a section through which a thru-via to deliver power signals to a die extends, where said section is made of a higher *k* material than that of the first dielectric interposer layer.

6. The device according to Claim 1, wherein said first dielectric interposer material comprises ceramic material to relieve stress between a die and a substrate.

7. The device according to Claim 1, wherein the device is generally rectangular in shape and has an array of thru-vias to deliver power signals to a die where said at least one thru-via to provide a signal other than a power signal to a die extends outside said array of thru-vias, and where the high k material of the second dielectric layer is adjacent to low *k* material that surrounds outside rows of thru-vias to provide signals other than power signals to a die; and

wherein the extended area of high *k* material of said second dielectric layer is formed with a space about the at least one thru-via designed to provide a signal other than a power signal in order to separate a power delivery network from another signal network.

8. The device according to Claim 7, further comprising a number of rows of thru-vias to provide signals other than power signals to a die, said number of rows of thru-vias surrounding said array of thru-vias to deliver power signals to a die.

9. The device according to Claim 8, further comprising at least a second extended area of high *k* material of said second dielectric layer formed to surround at least one thru-via to provide a signal other than a power signal to a die where said extended area of high *k* material and said at least a second extended area of high *k* material are formed on any side of said array of thru-vias.

10. The device according to Claim 1, wherein the high *k* material comprises a material having a permittivity greater than or equal to about 100.

11. The device according to Claim 1, wherein the low *k* material comprises a material having a permittivity less than about 10.

12. The device according to Claim 1, wherein said device comprises a thin film capacitor.

13. A package comprising:

a die having power delivery and non-power signal bumps;

an interposer substrate disposed adjacent the die and having thru-vias corresponding to the power delivery and non-power signal bumps of said die; and

a base substrate disposed on the other side of said interposer substrate from said signal bumps, disposed for delivering signals to the power delivery and non-power thru-vias of the interposer substrate and corresponding bumps of said die;

wherein said interposer substrate is made from a dielectric material with the power delivery and non-power signal thru-vias extending therethrough and comprises:

a first dielectric interposer layer through which the thru-vias extend; and

a second dielectric layer adjacent said first dielectric interposer layer where said second dielectric layer includes a high *k* material surrounding thru-vias to deliver power signals to said die and a low *k* material surrounding thru-vias to provide signals other than power signals to said die;

wherein said second dielectric layer is extended to surround at least one thru-via to provide a signal other than a power signal to said die.

14. The package according to Claim 13, wherein said at least one thru-via to provide a signal other than a power signal provides AC coupling for signals other than power signals.

15. The package according to Claim 14, wherein a high *k* material of the extended second dielectric layer surrounds said at least one thru-via to provide a signal other than a power signal to said die forming an AC coupling network; wherein the high *k* material of the extended second dielectric layer is adjacent low *k* material that surrounds thru-vias to provide signals other than power signals to said die; and wherein said extended second dielectric layer of high *k* material is formed with a space surrounding said an end of the at

least one thru-via adjacent a signal bump in order to separate a power delivery network from the AC coupling network.

16. The package according to Claim 15, wherein the AC coupling is for differential signals used for Peripheral Component Interconnect (PCI) applications.

17. The package according to Claim 13, wherein the first dielectric interposer layer has a section through which a thru-via to deliver power signals to said die extends, said section being made of a higher *k* material than that of the first dielectric interposer layer.

18. The package according to Claim 13, wherein said first dielectric interposer material comprises ceramic material to relieve stress between a die and a substrate.

19. The package according to Claim 13, wherein the substrate comprises organic material.

20. The package according to Claim 13, wherein the interposer substrate has an array of power delivery thru-vias, which is surrounded by rows of non-power signal thru-vias, and wherein the power delivery thru-vias and non-power signal thru-vias are coupled to the corresponding signal bumps of said die; and wherein at least one extended second dielectric layer surrounds at least one non-power signal thru-via.

21. The package according to Claim 13, wherein the high *k* material comprises a material having a permittivity greater than or equal to about 100.

22. The package according to Claim 13, wherein the low *k* material comprises a material having a permittivity less than about 10.

23. The package according to Claim 13, wherein said interposer substrate comprises a thin film capacitor about thru-vias to deliver power signals to said die; a split thin film capacitor about the at least one thru-via to provide a signal other than a power signal to said die; and a low *k* material area surrounding the remaining thru-vias to provide a signal other than a power signal to said die.

24. A method of fabricating a device comprising:

providing a first dielectric interposer layer through which a number of thru-vias extend;

providing a second dielectric layer adjacent said first dielectric interposer layer, said second dielectric layer being formed of a high *k* material that surrounds thru-vias to deliver power signals to a die and being formed of a low *k* material that surrounds thru-vias to provide a signal other than a power signal to a die; and

extending the high *k* material of said second dielectric layer to surround at least one thru-via to provide a signal other than a power signal to a die.

25. The method according to Claim 24, wherein said extended high *k* material of said second dielectric layer comprises an embedded capacitor and said extended high *k* material provides AC coupling for signals other than power signals of the at least one thru-via to provide a signal other than a power signal to a die.

26. The method according to Claim 25, further comprising forming a gap in said extended high *k* material about an end of said at least one thru-via to provide a signal other than a power signal to a die so that the AC coupling network is separated from the power delivery network of the thru-vias to deliver power signals.

27. The method according to Claim 24, further comprising forming a gap in said first dielectric interposer layer about thru-vias to deliver power signals to a die; and filling the formed gap with material of a higher *k* value than that of the first dielectric interposer layer.

28. The method according to Claim 27, wherein the gap is formed by etching the material of the first dielectric interposer layer about the thru-vias to deliver power signals to a die.

29. The method according to Claim 24, wherein the high *k* material comprises a material having a permittivity greater than or equal to about 100.

30. The method according to Claim 24, wherein the low *k* material comprises a material having a permittivity less than about 10.